2008

Green River
Regional Educational Cooperative

Grade 6
Mathematics

Multiple Choice
and
Constructed Response

Measured Progress

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Multiple Choice Items

Multiple Choice Item 1

Standard: MA-06-1.3.01: Number Operations — Students will add, subtract, multiply, and divide whole numbers, fractions, and decimals to solve real-world problems and apply order of operations to simplify numerical expressions.

Bloom's Taxonomy
Knowledge
Comprehension
Application
Analysis
Synthesis
Evaluation

Depth of Knowledge
Level 1
Level 2
Level 3
Level 4

Answer Key: D

Portion of Standard Being Addressed
This item requires the student to solve real-world problems by adding decimals.

1. Jason bought 3 packages of sliced ham. Two packages weighed 7.5 ounces each. The other package weighed 10.5 ounces. What was the total number of ounces of ham that Jason bought?

   A. 18.0
   B. 21.0
   C. 24.5
   D. 25.5

Multiple Choice Item 2

Standard: MA-06-1.3.01: Number Operations — Students will add, subtract, multiply, and divide whole numbers, fractions, and decimals to solve real-world problems and apply order of operations to simplify numerical expressions.

Bloom's Taxonomy
Knowledge
Comprehension
Application
Analysis
Synthesis
Evaluation

Depth of Knowledge
Level 1
Level 2
Level 3
Level 4

Answer Key: B

Portion of Standard Being Addressed
This item requires the student to solve real-world problems by subtracting fractions.

2. Mark's new puppy ate $1\frac{1}{3}$ cups of dog food on Monday and $1\frac{4}{5}$ cups of dog food on Tuesday. How much more dog food did the puppy eat on Tuesday than on Monday?

   A. $\frac{1}{5}$ cup

   B. $\frac{7}{15}$ cup

   C. $\frac{3}{5}$ cup

   D. $\frac{2}{3}$ cup

Multiple Choice Item 3

Standard: MA-06-4.1.01: Representations of Data Sets — Students will analyze and make inferences from data displays (drawings, tables/charts, pictographs, bar graphs, circle graphs, line plots, Venn diagrams, line graphs, stem-and-leaf plots).

Bloom's Taxonomy
Knowledge
Comprehension
Application
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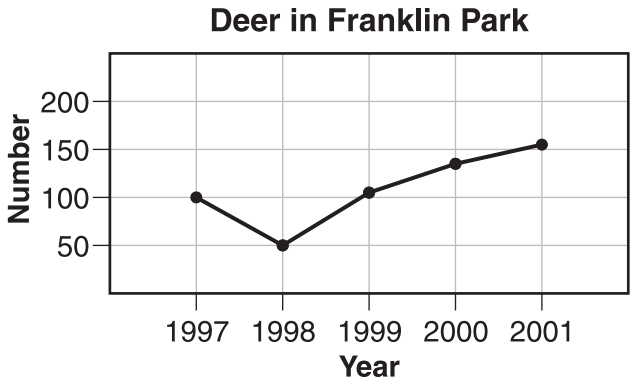
Evaluation

Depth of Knowledge
Level 1
Level 2
Level 3
Level 4

Answer Key: C

Portion of Standard Being Addressed
This item requires the student to analyze data in a line graph.

3. Use the graph below to answer the question.



The graph shows the number of deer in Franklin Park from 1997 to 2001. Which is the most likely estimate for the number of deer in Franklin Park in 2002?

A. 100
B. 150
C. 175
D. 225

Multiple Choice Item 4

Standard: MA-06-5.1.02: Patterns, Relations, and Functions — Students will create tables for functions and will apply the tables to solve real-world problems.

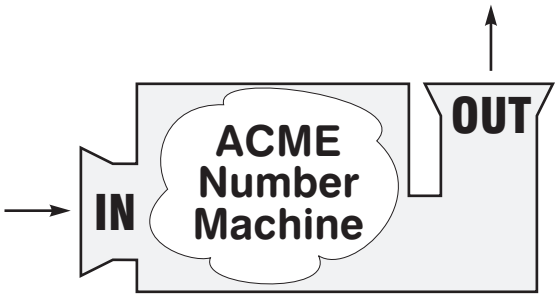
Bloom's Taxonomy
Knowledge
Comprehension
Application
Analysis
Synthesis
Evaluation

Depth of Knowledge
Level 1
Level 2
Level 3
Level 4

Answer Key: D

Portion of Standard Being Addressed
This item requires the student to describe rules for a pattern.

4. Mrs. Travis showed the class a new number machine. When you put a number in, a different number comes out. Here are some numbers the class tried.



IN	2	3	4	5	8
OUT	3	5	7	9	15

Which statement describes what the number machine is doing?

A. It is adding 4 and subtracting 1.
B. It is subtracting 5 and adding 2.
C. It is adding 3 or 5.
D. It is multiplying by 2 and subtracting 1.

Multiple Choice Item 5

Standard: MA-06-5.3.01: Equations and Inequalities — Students will model and solve real-world and mathematical problems with simple equations and inequalities (e.g., 8x=4, x+2>5).

Bloom's Taxonomy
Knowledge
Comprehension
Application
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Synthesis
Evaluation

Depth of Knowledge
Level 1
Level 2
Level 3
Level 4

Answer Key: C

Portion of Standard Being Addressed
This item requires the student to substitute values for two different variables.

5. To find average speed, use the formula $d = rt$, where
   - d is distance in miles,
   - r is speed in miles per hour, and
   - t is time in hours.

   Lindsey biked 35 miles in 2 hours. What was her average speed?

   A. 44.4 miles per hour
   B. 43 miles per hour
   C. 17.5 miles per hour
   D. 9.0 miles per hour

Constructed Response Items

Constructed Response Item 6 Graph of Economy

Standard: MA-06-1.1.03: Number Sense — Students will convert between any two of the following numbers: fractions, decimals, and percents (less than or equal to 100%); and will compare and order these numbers.

Bloom's Taxonomy
Knowledge
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Level 1
Level 2
Level 3
Level 4

6. Wyoming's economy revolves around three industries:
   - extraction of minerals—$3,300,000,000
   - tourism—$1,700,000,000
   - agriculture—$1,500,000,000

   a. What is the total income from these three industries?

   b. What percent, to the nearest whole percent, of the total income is represented by each industry? Show your work or explain how you got your answer.

   c. Sketch a circle graph of this data. Label each section with the name of the industry it represents.

Graph of Economy

Scoring Guide

Score	Description
4	The student demonstrates a thorough understanding of percents and circle graphs by correctly calculating percents and sketching an appropriate circle graph to display the data.
3	The student demonstrates a general understanding of percents and circle graphs by calculating percents and sketching a circle graph to display the data with only minor errors or omissions. The response indicates that the student could readily correct any errors and omissions if given written feedback.
2	The student demonstrates a basic understanding of percents and circle graphs by correctly completing a significant portion of the required tasks. The response indicates that the student would require some instruction to successfully complete the tasks.
1	The student demonstrates a minimal understanding of percents and circle graphs. The response indicates that the student would require significant instruction to complete the tasks.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Sample Response:

Part a: **$6,500,000,000**

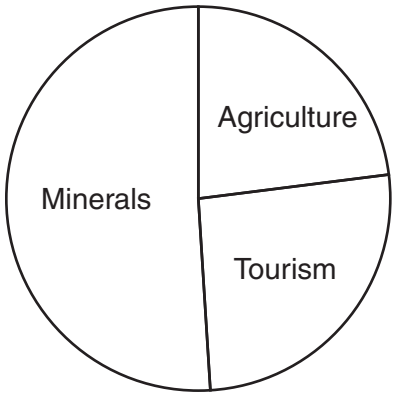
Part b: **Minerals** **33/65 × 100 = 51%**

Tourism **17/65 × 100 = 26%**

Agriculture **15/65 × 100 = 23%**

Part c:

Wyoming's Economy



Sample Student Responses

Graph of Economy

37.

a) The total income of these threes industries is

$ 65,500,000,000

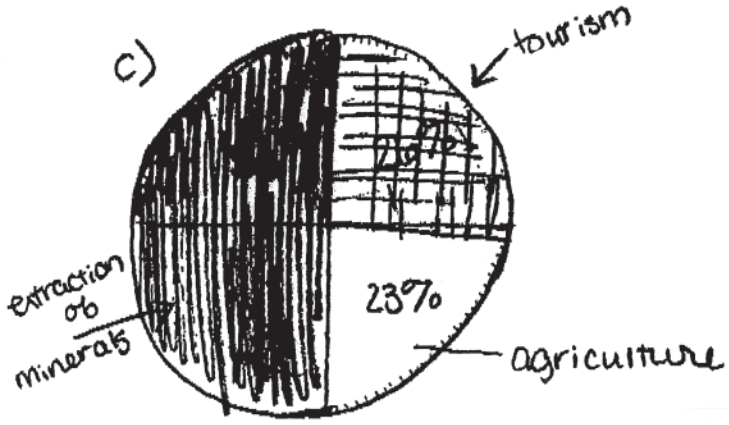
b) $33/65 \approx 51\%$ of the total income is represented by extraction of minerals.

$17/65 \approx 26\%$ of the total income is represented by tourism.

$15/65 \approx 23\%$ of the total income is represented by agriculture.

100%

c)



Score Point: 4

37.

a. 6,500,000,600

b. extract
51°
Tourism
27°
Agriculture
230°

c.

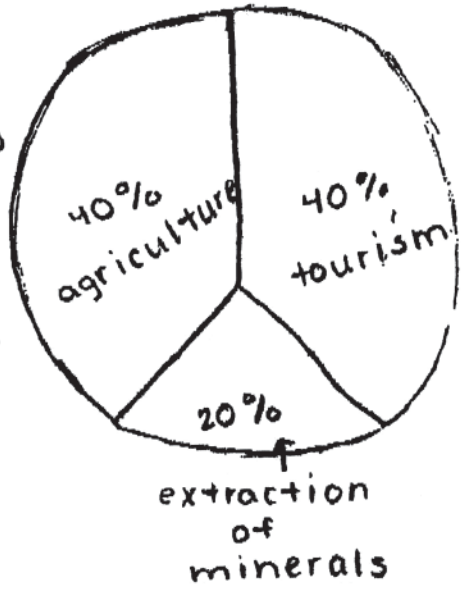
Score Point: 3

37. (a) 3,300,000,000 + 1,700,000,000 + 1,500,000,000 = 6,500,000,000

(b) 6,500,000,000 ÷ 3,300,000,000 = 20% - minerals
6,500,000,000 ÷ 1,700,000,000 = 40%
6,500,000,000 ÷ 1,500,000,000 = 40%

(c)

I knew the 40% would be a little less than half so I drew two of them and then the section left over was 20%.



Score Point: 2

Constructed Response Item 7 Number Cubes with Odd/Even Numbers

Standard: MA-06-4.4.03: Probability — Students will explore the theoretical probability of simple events.

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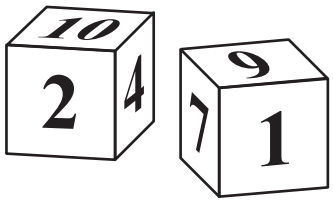
Level 4

7. Use the picture below to answer the question.



Dave has 2 number cubes. One cube has the even numbers 2, 4, 6, 8, 10, and 12 written on the faces. The other cube has the odd numbers 1, 3, 5, 7, 9, and 11 written on the faces.

a. List all the possible combinations of 2 numbers Dave could get when the two cubes are thrown together.

b. What is the probability that when the cubes are thrown together, the sum of the 2 numbers is even? Explain your answer.

c. What is the probability that when the cubes are thrown together, the sum of the 2 numbers is a multiple of 5? Explain your answer.

Number Cubes with Odd/Even Numbers

Scoring Guide

Score	Description
4	Student demonstrates a thorough understanding of counting procedures and probability by accurately listing all of the possible combinations of elements (one from each of two sets), calculating the probability of two events and communicating a correct strategy.
3	Student demonstrates a general understanding of counting procedures and probability by listing all of the possible combinations of elements (one from each of two sets), calculating the probability of at least one event, and communicating a correct strategy with only minor errors.
2	Student demonstrates basic understanding of counting procedures and/or probability by completing a significant portion of the required tasks.
1	Student showed minimal understanding of counting procedures or probability.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Sample Response:

Part a:

1	2, 4, 6, 8, 10, 12
3	2, 4, 6, 8, 10, 12
5	2, 4, 6, 8, 10, 12
7	2, 4, 6, 8, 10, 12
9	2, 4, 6, 8, 10, 12
11	2, 4, 6, 8, 10, 12

Sum Chart

	2	4	6	8	10	12
1	3	5	7	9	11	13
3	5	7	9	11	13	15
5	7	9	11	13	15	17
7	9	11	13	15	17	19
9	11	13	15	17	19	21
11	13	15	17	19	21	23

Part b: 0 because adding an even and odd number always results in an odd number OR 0 *refers to Sum Chart created by student.*

Part c: $\frac{7}{36}$ *refers to Sum Chart* OR There are only 7 times out of 36 that the sum is 5 or 15, $\frac{7}{36}$

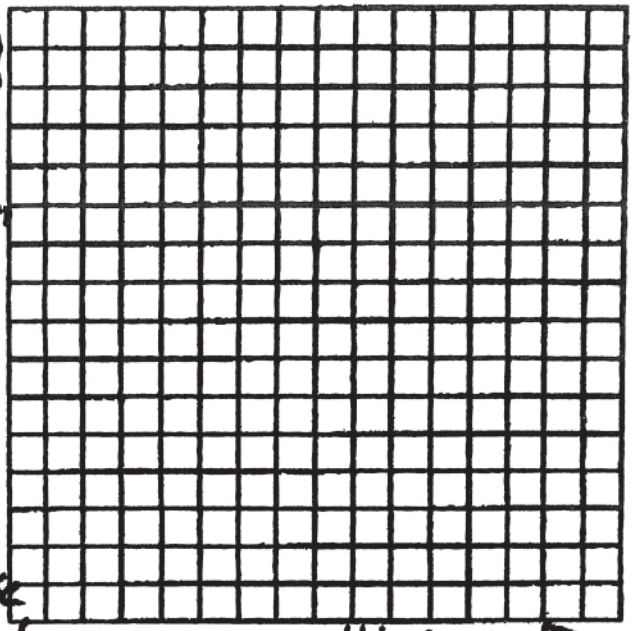
Sample Student Responses

Number Cubes with Odd/Even Numbers

a) 1+2, 1+4, 1+6, 1+8, 1+10, 1+12,
2+3, 2+5, 2+7, 2+9, 2+11, 3+4, 3+6,
3+8, 3+10, 3+12, 4+5, 4+7, 4+9, 4+11,
5+6, 5+8, 5+10, 5+12, 6+7, 6+9, 6+11,
7+8, 7+10, 7+12, 8+9, 8+11, 9+10, 9+12,
10+11, 11+12

b) The probability is 0. It is imposible. An even plus an odd will always equal an odd.

c) The probability is $\frac{7}{36}$ because 7 of the 36 posible combinations are multiples of 5.



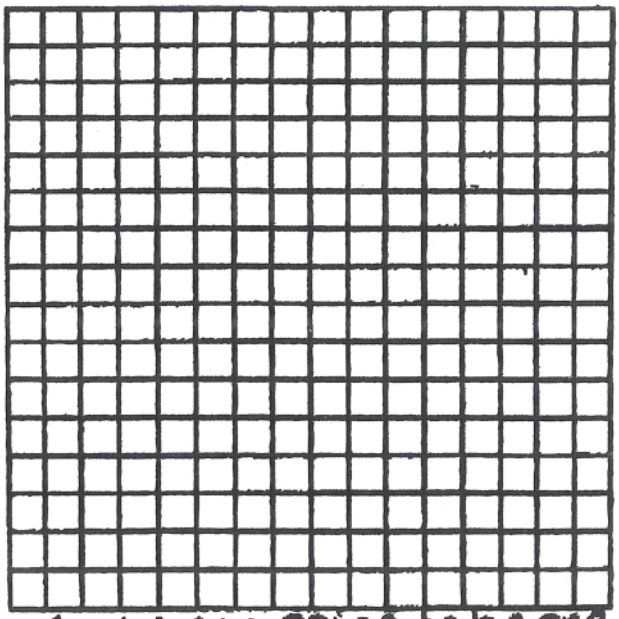
Score Point: 4

A.

2,1	(2,3)	2,5	2,7	2,11	
(4,1)	4,3	4,5	4,7	(4,11)	2,9
6,1	6,3	6,5	6,7	6,11	4,9
8,1	8,3	8,5	(8,7)	8,11	(6,9)
10,1	10,3	(10,5)	10,7	10,11	8,9
12,1	12,3	12,5	12,7	12,11	10,9
					12,9

B. It is never going to have a sum that's even. Its because if you have a even number and you are always going to be adding a odd to it, it is always going to come out odd.

C. 5/36 that the sum is going to be a multiple of 5. Because some of the multiples of 5 are odds.



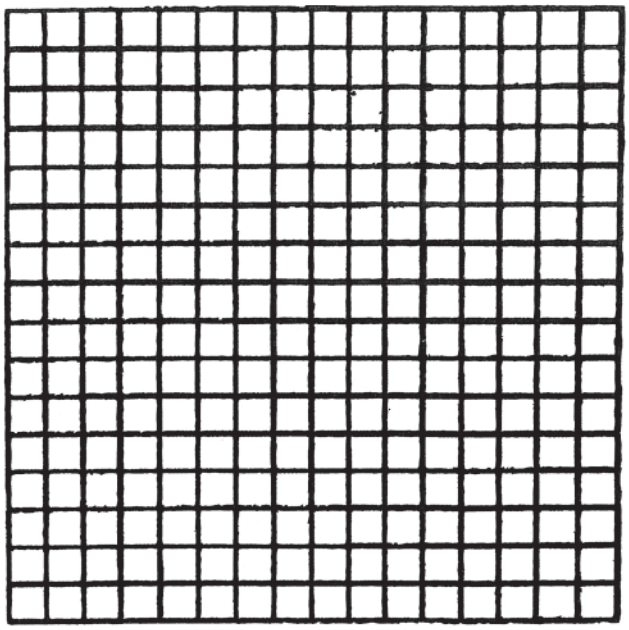
So there is going to be one in each column I showed.

Score Point: 3

36 b never because you can only subtract even and a odd and get a odd.

1,2
1,4 3,4 9,4
1,6 3,6 9,6
1,8 3,8 9,8
1,10 3,10 9,10
1,12 3,12 9,12
3,2 7,2 11,2
3,4 7,4 11,4
3,6 7,6 11,6
3,8 7,8 11,8
3,10 7,10 11,10
3,12 7,12 11,12
5,2 9,2

c 4



Score Point: 2